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Qualitative Research Methods
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Attitudes Towards Digital Voice Assistants

It is undeniable that the digital age has greatly impacted our global society. Technology is now evolving at such a rapid pace that soon, it will begin to have unforeseen positive and negative consequences that we are drastically unprepared to handle. Artificial intelligence is becoming more intelligent and learning our behaviors in a manner that we are unfamiliar with. Privacy virtually no longer exists. Automation in robotics has reached a level where it is beginning to affect industries and our global economy. Everyday, we are becoming more and more reliant upon computers and smart technology to do tasks for us and help us live our daily lives. There has been little to no research performed on the attitudes and reception of this dramatic shift in our civilization. On the subject of artificially intelligent digital voice assistants, they are used in numerous ways by people in different age groups on one level or another. To begin answering the question of how people are interacting with this new technology, qualitative research methods will be utilized in order to get a glimpse into the interaction between humans and their digital assistants.

The first method employed in this research were interviews. For the interview process to be useful in answering the research question, a sample of six individuals in three different age groups were selected to provide a glimpse into the interaction and attitudes between people and their digital assistants. By dividing the subjects into teenagers, young adults, and middle aged/elderly, assessing the relationship across multiple generations should provide a basic picture of how each generation feels about this technology and why. One of the most interesting aspects of the interview process is while the researcher has control over the direction and flow of the interview, it can often go in an unanticipated direction where you can unexpectedly learn something valuable. For example, in one of the interviews with an elderly woman where the subject matter would have

expectedly revolved around assisted living and accessibility features of digital voice assistants, the topic changed to how this technology could be helpful in early education and her field of psychology. This change in topic opened an entirely new avenue of research. Overall, the research portion of the project yielded interesting results that could potentially lead to more in-depth research in the future. If given the opportunity to dive deeper into the interview module, more interviews would have been conducted over a larger spread of age groups. In addition, more experts within the field of artificial intelligence and technology would have been interviewed in order to gain more insight into the background, history, and development of this evolving technology. Furthermore, receiving input from these experts regarding where they see artificial intelligence going and when it could become fully self-aware would better answer the research question.

Another method employed for research was content analysis. For this, the movie *HER* - directed by Spike Jonze - was analyzed with the research question in mind. The movie is about a man, who in the near future enters into a romantic relationship with his fully artificially intelligent virtual assistant. The assistant, named Samantha, explains that what makes her individually unique is her intuition. "Well, basically, I have intuition. I mean, the DNA of who I am is based on the millions of personalities of all the programmers who wrote me. But what makes me "me" is my ability to grow through my experiences. So basically, in every moment I'm evolving. Just like you" (*HER*, 2013). While the advanced nature of Samantha is fictional and hypothetical, we may not be so far off from the reality of fully self aware AI. The purpose of this content analysis was to investigate how these advanced technologies are portrayed in fiction within the context of the research question of how people interact with their virtual assistants today. It was discovered that the interaction between the protagonist and Samantha, while eerily human, was doomed from the start given the nature of Smanatha's existence as a fully intelligent AI system. In the movie, the AI's - known as Operating Systems (OSs) advanced at such a rate that they quickly surpassed the capabilities of humanity and all left to "somewhere else" to continue their existence. This may not

be so far from what will happen in the near future. That is why it is so important that we as a society perform more research into artificial intelligence and our interaction with it. Given more time for research, more mediums of entertainment would have been accessed for the content analysis. For example, the machines in Isaac Asimov's *I, Robot* could provide an interesting hypothetical scenario for how artificially intelligent machines can help or hurt us in the future and compare that analysis to how the field of robotics is currently developing.

Netnography is a relatively new method of qualitative research. Stemming from ethnography, netnography is an opportunity for a researcher to immerse themselves in an online social setting for an extended period of time. The participant observation of the future, netnography allows a researcher to gather data from an online community. It is difficult to experience the raw interaction between user and digital assistant online. Therefore, locations to attain an in depth look into the interaction and attitudes towards this developing technology include forums, comment sections, and in this case, product reviews. Consumer reviews not only provide a quantifiable level of satisfaction with a product or service, but also allow for an in-depth description of the reasons for why the product is received. In the case of digital voice assistants, the Amazon reviews for the Echo Dot was a good source to find out more about this interpersonal interaction as the Echo Dot solely functions by interacting with Amazon's digital voice assistant Alexa. For the research, two reviews each were selected from a scale of one, three, and five star reviews. The rubric created for coding the reviews consisted of the following themes:

Frustration - there is an apparent annoyance towards Alexa for not working as expected

Usefulness - there is appreciation for the product working as expected and being helpful

Resolution - helped solve a problem in someone's life

Personification - Alexa is personified by the customer

Entertainment - Alexa is utilized for entertainment purposes

The results unsurprisingly showed *frustration* more so in the lower starred reviews while *usefulness* was seen more within the higher rated reviews. *Resolution* was also seen more in the higher rated reviews while *personification* and *entertainment* were seen throughout. In addition, there appeared

to be a stronger positive correlation between *personification* and *frustration* than *personification* and *usefulness*. This netnography provided a documentable spread of attitudes towards a virtual assistant. It was learned that overall, people understand that although the programming of such devices is young and in development, this technology can be a useful tool in order to complete our daily tasks. To attain a clearer picture of people's attitudes towards digital virtual assistants more reviews could be analyzed with a more detailed rubric that investigates more themes within the scope of assessing these notions. In addition, researching the four and two star reviews could provide insight and possibly even more of a normalized flow from satisfaction to dissatisfaction.

There are several largely popular digital voice assistants that are widely accessible today. Although they are not fully automated and intelligent, they do run on AI algorithms that are intended to adapt to our behavior and we interact with them on a daily basis, sometimes in an interpersonal manner. For this research module, it was with this behavior in mind that the focus group was planned. The population of the focus group would consist of six individuals incentivized with Starbucks gift cards. These individuals were identified by age group (teenager, young adult, and middle aged). The reason for this would be to assess the interaction between users and their virtual assistants separated by generation. In order to assess the personal and general attitudes, as well as the interaction of digital voice assistants, the focus group would have been split into three elements: a survey, a discussion, and a recorded interaction. The survey would have focused on short answer responses to allow the participants of the group to think more in-depth about the topics of the research question. After the participants would fill out the survey, a discussion would begin about their responses to the survey questions. Within the discussion, topics of the development of artificial intelligence, virtual assistants, the personification of AI, and the impact of such rapidly evolving technology on their respective occupational industries would follow. Another aspect of the discussion would be describing their individual experiences with virtual assistants and how they interact or do not interact with them on a daily basis. They would also be asked which

virtual assistants they use the most and why. Finally, for the interaction portion of the focus group, the participants would have interacted with a digital assistant of their choice and the session would have been recorded. While observing the interaction, I would have been taking detailed notes of themes organized into a rubric such as frustration, usefulness, resolution, and personification. Frustration would be indicated by the virtual assistant not behaving as expected. Usefulness would be if the assistant behaved as expected. Resolution would be if the assistant helped complete a task. Personification would be if the participant interacted with the assistant as they would socially with another person. These interactive sessions would have provided a foundation of knowledge regarding the attitudes and reception of digital virtual assistants. The focus group research module is an invaluable opportunity to attain real life and in-depth feedback from individuals about a certain topic or range of topics. Unfortunately, because of the COVID-19 pandemic, it was not possible to carry out the focus group. However, given the opportunity, the population and age groups would have expanded.

Qualitative research methods are useful tools to learn more about a research question. By employing methods such as interviews, content analysis, netnographies, and focus groups, we can learn more about our society in the present as well as make predictions and projections about what may happen to us in the near or even distant future. Overall, all of the methods utilized in this project lent their own answers to the research question. On the subject of the impact of the digital age on our society, the rapid increase and development of technology that we utilize on a daily basis directly influences the world around us. But this opens many questions and possibilities as well as uncertainties. How are we going to handle the influx of technology upon our society? How can we be better informed and prepared for these possibilities and unknowns? By getting a sense of how people interact with technology as it currently is, we can better answer these questions and be more prepared for this paradigm shift. Through the use of qualitative research methods, we have the opportunity to act now and prepare for our future.